6101 PREMIUM TYPE

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MEDIUM-MU TWIN TRIODE

MINIATURE TYPE

Intended for applications at altitudes up to 55000 feet and where dependable performance under shock and vibration is paramount.

GENERAL DATA

Electrical:

Heater, for Unipotential Cathode:

Voltage	6.3 ± 10%	ac or dc volts
Current	0.45	amp

Direct Interelectrode Capacitances (Each Unit, approx.)*:

Grid to Plate	1.5	μμf
Input	2.0	μμf
Output	0.4	μμf
Heater to Cathode	6.0	μμf

Characteristics, Class A_1 Amplifier:

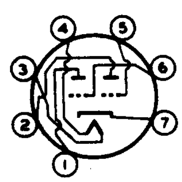
Plate Supply Voltage	100	volts
Cathode-Bias Resistor	50#	ohms
Amplification Factor	38	
Plate Resistance	6300	ohms
Transconductance	6000	μmhos
Plate Current	8.5	ma

Mechanical:

Mounting Position	Any
Maximum Overall Length	2-1/8"
Maximum Seated Length	1-7/8"
Length, Base Seat to Bulb Top (Excluding tip)	1-1/2" ± 3/32"
Maximum Diameter	3/4"
Bulb	T-5-1/2
Base	Small-Button Miniature 7-Pin (JETEC No.E7-1)

BOTTOM VIEW

Pin 1 - Plate of Unit No.2
Pin 2 - Plate of Unit No.1
Pin 3 - Heater
Pin 4 - Heater



Pin 5 - Grid of Unit No.1
Pin 6 - Grid of Unit No.2
Pin 7 - Cathode

AMPLIFIER - Class A_1

Values are for each unit

Maximum Ratings, *Absolute Values:*

	For Pressures Down to 55 ± 5 mm of Hg**	
PLATE VOLTAGE	330 max.	volts

* With no external shield.
** Corresponds to altitude of about 55000 feet.
Value is common to both units operating at the specified conditions.

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PLATE DISSIPATION	0.85	max.	watt
PEAK HEATER-CATHODE VOLTAGE:			
Heater negative with respect to cathode .	180	max.	volts
Heater positive with respect to cathode .	180	max.	volts
BULB TEMPERATURE (At hottest point on bulb surface)	165	max.	°C

Maximum Circuit Values (For maximum rated conditions):

Grid-Circuit Resistance:			
For fixed-bias operation	Not recommended		
For cathode-bias operation	0.5	max.	megohm

CHARACTERISTICS RANGE VALUES FOR EQUIPMENT DESIGN

	Note	*Min.*	*Max.*	
Heater Current	1	0.420	0.480	amp
Grid-to-Plate Capacitance (Each Unit).	2	1.2	1.8	μμf
Grid-to-Cathode Capacitance (Each Unit).	2	1.4	2.8	μμf
Plate-to-Cathode Capacitance (Unit No.1).	2	0.25	0.65	μμf
Plate-to-Cathode Capacitance (Unit No.2).	2	0.25	0.55	μμf
Heater-to-Cathode Capacitance .	2	4.0	8.0	μμf
Amplification Factor	1,3	28	48	
Plate Current (1)	1,4	6.5	11.5	ma
Plate Current (2)	1,5	-	200	μamp
Plate Current (3)	1,7	5	-	μamp
Transconductance (1).	1,4	4500	7500	μmhos
Transconductance (2).	6,4	▲	-	μmhos
Reverse Grid Current (1). . . .	1,8	-	0.5	μamp
Reverse Grid Current (2). . . .	9,10	-	1.0	μamp
Heater-Cathode Leakage Current:				
Heater negative with respect to cathode . . .	1,11	-	10	μamp
Heater positive with respect to cathode . . .	1,11	-	10	μamp
Leakage Resistance Per Unit:				
Between Grid and All Other Electrodes Tied Together	1,12	100	-	megohms
Between Plate and All Other Electrodes Tied Together	1,13	100	-	megohms

Note 1: With 6.3 volts ac or dc on heater.

Note 2: With no external shield.

Note 3: With plate supply voltage of 100 volts, cathode-bias resistor of 50 ohms common to both units, and a cathode bypass capacitor of 1000 μf. Each unit tested separately and with both units operating.

Note 4: With plate supply voltage of 100 volts and cathode-bias resistor of 50 ohms common to both units. Each unit tested separately and with both units operating.

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Note 5: With dc plate voltage of 250 volts, and dc grid voltage of -14.5 volts. Each unit tested separately and with both units operating.

Note 6: With 5.7 volts ac or dc on heater.

Note 7: With plate supply voltage of 250 volts and dc grid voltage of -10.5 volts. Each unit tested separately and with both units operating.

Note 8: With plate supply voltage of 250 volts, grid-circuit resistance of 1.0 megohm common to both units, and cathode-bias resistor of 500 ohms common to both units. Plate of unit No.1 tied to plate of unit No.2; grid of unit No.1 tied to grid of unit No.2.

Note 9: With 7.0 volts ac or dc on heater.

Note 10: With plate supply voltage of 100 volts, grid-circuit resistance of 1 megohm common to both units and cathode-bias resistor of 50 ohms common to both units. Plate of unit No.1 tied to plate of unit No.2; grid of unit No.1 tied to grid of unit No.2.

Note 11: With 100 volts dc between heater and cathode.

Note 12: With grid 100 volts negative with respect to all other electrodes tied together.

Note 13: With plate 300 volts negative with respect to all other electrodes tied together.

SPECIAL RATINGS & PERFORMANCE DATA

Shock Rating:

Impact Acceleration . . . . 500 max. g

This test is performed on a sample lot of tubes from each production run to determine ability of tube to withstand the specified impact acceleration. Tubes are held rigid in four different positions in a Navy Type, High-Impact (flyweight) Shock Machine and are subjected to 20 blows at a hammer angle of 30° (equivalent to the specified maximum impact acceleration). At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for vibration, heater-cathode leakage current, and transconductance.

Fatigue Rating:

Vibrational Acceleration . . . . . . 2.5 max. g

This test is performed on a sample lot of tubes from each production run to determine ability of tube to withstand the specified vibrational acceleration. Tubes are rigidly mounted and subjected in each of three positions to 2.5 g vibrational acceleration at 60 cycles per second for 32 hours. At the end of this test, tubes will not show permanent or temporary shorts or open circuits, and are required to meet established limits for fatigue, heater-cathode leakage current, and transconductance.

Low-Frequency Vibration Performance:

RMS Output Voltage . . . . 25 max. millivolts

This test is performed on a sample lot of tubes from each production run to determine ability of tube to withstand low-frequency vibration of its elements with consequent

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generation of audio noise as determined by the measured rms output voltage. Plate of unit No.1 tied to plate of unit No.2 and grid of unit No.1 tied to grid of unit No.2; dc plate voltage of 250 volts, dc grid voltage of -8 volts, plate load resistance of 20000 ohms, and vibrational acceleration of 2.5 g at 25 cps.

Audio-Frequency Noise and Microphonic Performance:

RMS Output Voltage . . . . 70 max. millivolts

This test is performed on a sample lot of tubes from each production run to determine susceptibility of tube to movement of its elements when tapped and consequent generation of audio noise as determined by the measured rms output voltage. Plate of unit No.1 tied to plate of unit No.2, grid of unit No.1 tied to grid of unit No.2, plate supply voltage of 100 volts, grid-circuit resistance of 0.1 megohm common to both units, cathode-bias resistor of 50 ohms common to both units, and plate load resistance of 10000 ohms.

Glass Strain Test:

This test is performed on a sample lot of tubes from each production run to check for tubes which may have been improperly processed. Tubes are completely submerged in boiling water (97°C to 100°C) for a period of 15 seconds and then immediately submerged in ice water (0°C to 3°C). Tubes will withstand this treatment without loss of vacuum.

Shorts and Continuity Test:

This test is performed on a sample lot of tubes from each production run. In this test a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid current in excess of 1.0 microampere under the conditions specified in the CHARACTERISTICS RANGE VALUES for reverse grid current (1).

1-Hour Stability Life Performance:

This test is performed on a sample lot of tubes from each production run to insure that the tubes have been properly stabilized. With both units operating, each unit is checked for variation in transconductance under conditions of maximum rated plate dissipation. At the end of 1 hour, the value of transconductance of each unit is read. The variation in transconductance from the 0-hour reading will not exceed 12 per cent.

100-Hour Life Performance:

This test is performed on a sample lot of tubes from each production run under conditions of maximum rated plate dissipation to insure a low percentage of early inopera-

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tives. At the end of 100 hours, a tube is considered inoperative if it shows a permanent or temporary short or open circuit, or a value of reverse grid current in excess of 1.0 microampere under the conditions specified in CHARACTERISTICS RANGE VALUES for reverse grid current (1).

500-Hour Average Life Performance:

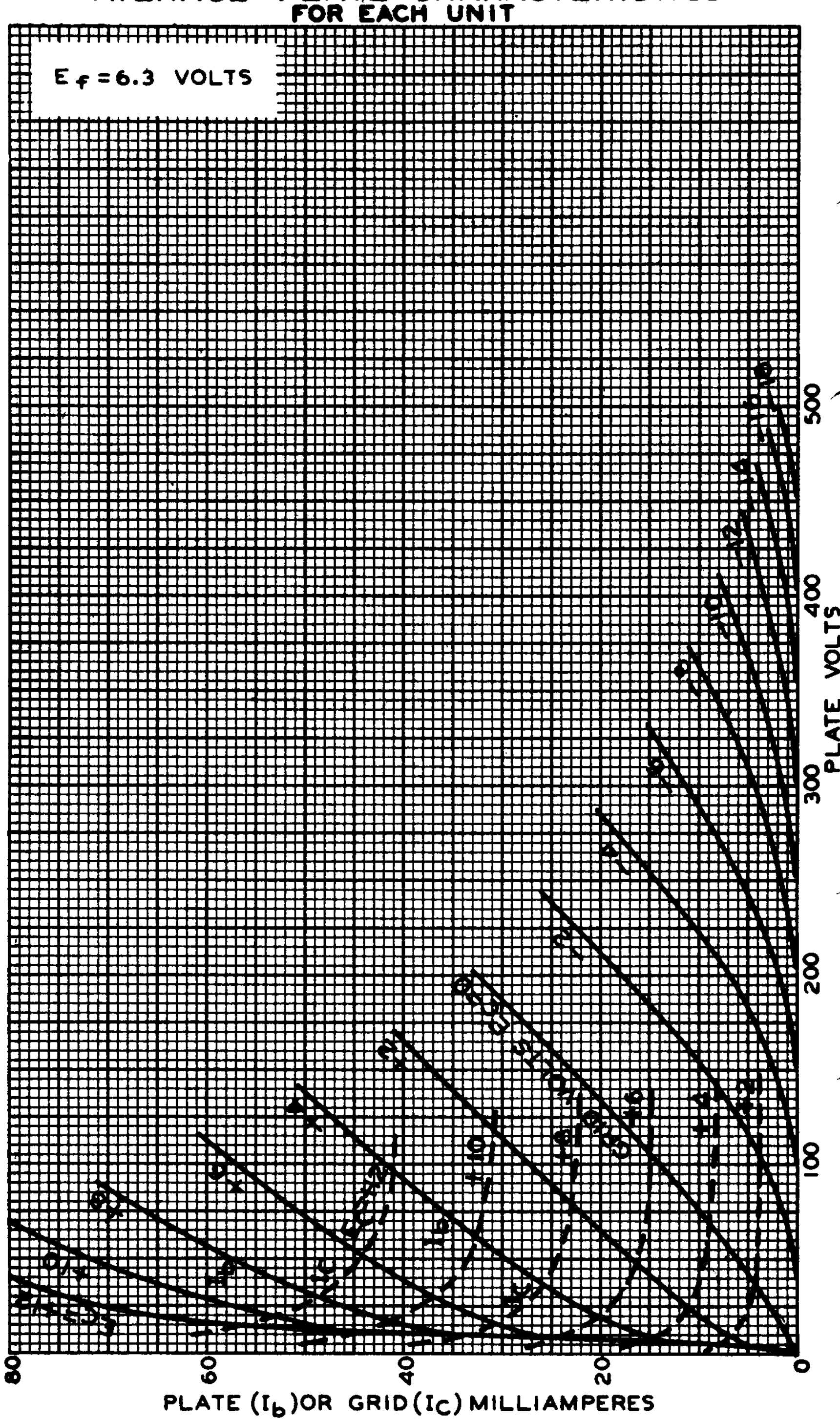
This 500-hour test is made on a sample lot of tubes from each production run to insure high quality of the individual tube and to guard against epidemic failures of any of the characteristics indicated below. With both units operating, each unit is life tested separately at room temperature under the following conditions: heater voltage of 6.3 volts ac or dc, plate supply voltage of 100 volts, dc heater-cathode voltage (heater positive with respect to cathode) of 180 volts, and cathode bias resistor (common to both units) of 50 ohms. At the end of 500 hours, the tubes will not show permanent shorts or open circuits and will be criticized for the total number of defects in the sample lot and for the number of tubes failing to pass the established limits of heater current, transconductance with 6.3 volts ac or dc on heater, transconductance with 5.7 volts ac or dc on heater, plate current (1), reverse grid current (2), heater-cathode leakage current, and leakage resistance per unit.

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AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



JULY 13, 1953

TUBE DEPARTMENT

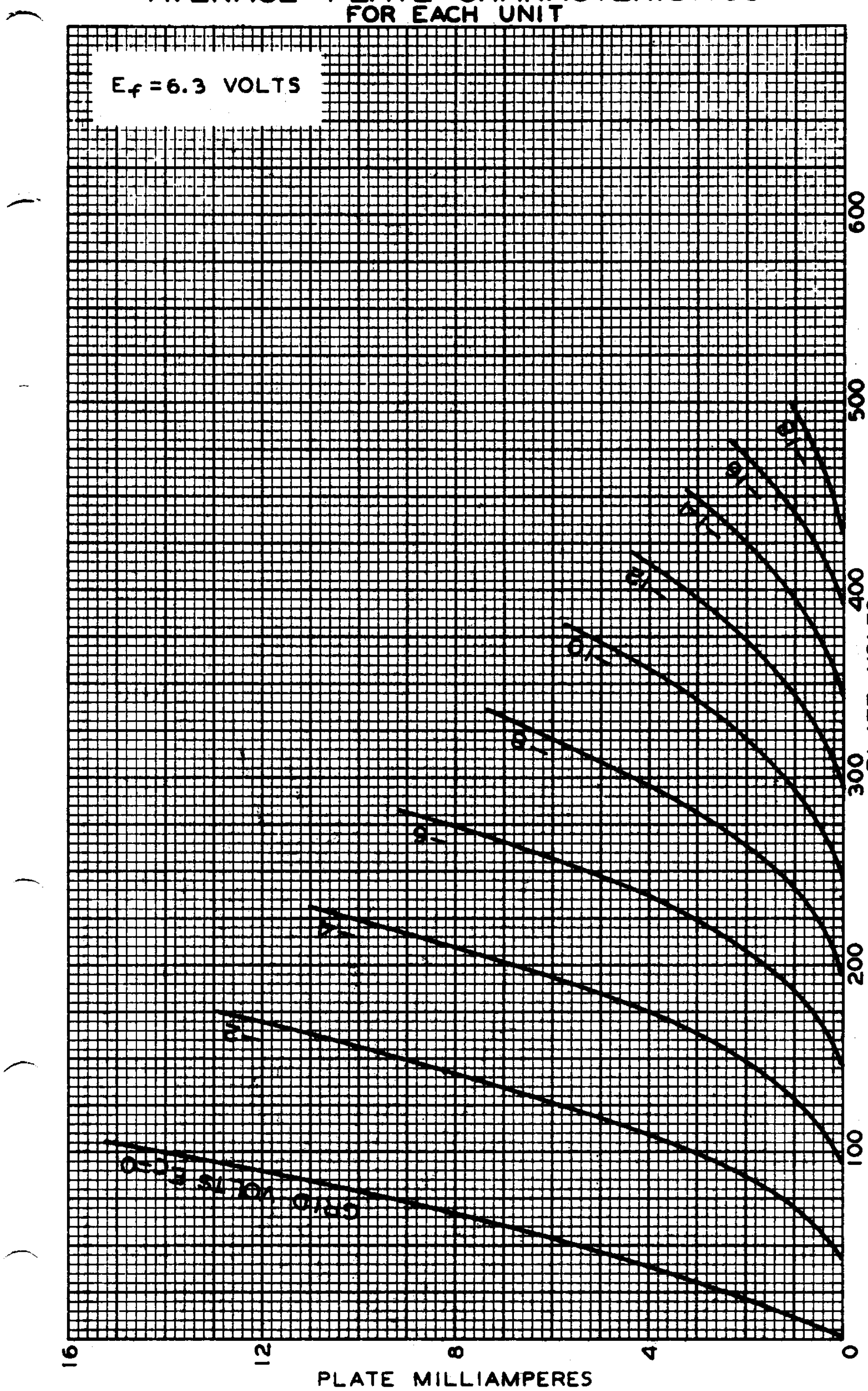
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AVERAGE PLATE CHARACTERISTICS
FOR EACH UNIT



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AVERAGE CHARACTERISTICS
FOR EACH UNIT

